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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/765,807	01/27/2004	James F. Garvey	20420.0003 (Garvey et al.	2456

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EXAMINER
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CONLEY, SEAN EVERETT

ART UNIT	PAPER NUMBER
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1744

DATE MAILED: 03/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/765,807	Applicant(s)  GARVEY ET AL.	
	Examiner Sean E. Conley	Art Unit 1744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 January 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 2,4,5,11 and 12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,6-10 and 13-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some    \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election of generic claim 1, Species II of Group A (i.e., claim 3), Species II of Group B (i.e., claims 6-7) and Species I of Group C (i.e., claim 10) in the reply filed on January 11, 2006 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Claims 2, 4, 5, 11 and 12 are withdrawn from consideration as being directed to non-elected species.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 3, 6-9, 13-15, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Zuckerberg et al. (U.S. Patent No. 3,966,407).

Regarding claims 1, 9, and 13, Zuckerberg et al. discloses a method of altering a fluid-borne contaminant, comprising the steps of: providing a pump (compressor (24)) having an inlet and an outlet; connecting the pump (compressor (24)) inlet to a source of contaminated fluid (contaminated air with infectious pathogens and viruses supplied to input baffle and filter arrangement (22) of a flow loop path – see col. 3, lines 23-45;

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col. 1, lines 10-66); operating the pump at a pressure ratio of at least 2.0 so as to sufficiently elevate the temperature of the fluid and contaminants passing through the pump, the compressor pressure ratio (CPR) is calculated using the following thermodynamics equation (see attached "NASA Compressor Thermodynamics"):

$$\text{CPR} = (T_2 / T_1)^{(\gamma/\gamma-1)} = P_2 / P_1$$

$T_2 = 360^\circ\text{F}$  (Temperature at outlet),  $P_2 = \text{Outlet pressure}$

$T_1 = 60^\circ\text{F}$  (Temperature at inlet),  $P_1 = \text{Inlet pressure}$

$\gamma = 1.4$  (for air)

CPR = 530;

and controlling the time during which the temperature of said fluid (air) and contaminants are elevated; to thereby alter substantially all of said contaminants passing through said pump (compressor (24)) (see col. 4, lines 12-30).

Regarding claim 3, Zuckerberg et al. discloses that the process sterilizes a contaminated air stream (see col. 1, lines 5-12). It is well known that air contains oxygen (approximately 21%) which causes oxidation when combined with substances. The oxidation effect from the oxygen in the air stream will cause the contaminants in the air stream to be altered.

Regarding claims 6 and 7, Zuckerberg et al. discloses that the method of sterilizing the air removes sources of infection found in the air of a large area medical service facility such as an operating room (see col. 1, lines 10-66; col. 3, lines 8-12). Infection is caused by pathogenic microorganisms that enter into a bodily part or tissue

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(see definition of "infection" found in the American Heritage Dictionary). Furthermore, Zuckerberg et al. discloses that source of infections are also viruses (see col. 1, lines 40-41). Therefore, the method of Zuckerberg et al. is removing contaminants such as pathogens and viruses.

Regarding claim 8, Zuckerberg et al. discloses that the fluid being treated is air that is compressed by compressor (24) (see col. 3, lines 33-42; col. 4, lines 12-20).

Regarding claim 14, Zuckerberg et al. discloses that suitable valves (44) are provided in the air closed loop flow path for adjusting the flow of air through the loop system, thus controlling the time the air is in the compressor. Furthermore, the heated compressed air is maintained at a temperature for a period of time sufficient to achieve substantially complete sterilization and with higher temperature systems the duration may be shorted. Thus depending on the temperature of the air and time required for complete sterilization the valves (44) are adjusted as necessary (see col. 3, lines 60-65; col. 4, lines 25-31).

Regarding claim 15, Zuckerberg et al. discloses that the fluid (air) is heated to a temperature of about 700°F at the outlet of the compressor (24) which is higher than the applicant's claimed limitation of at least 200°C (see col. 4, lines 15-30).

Regarding claim 19, Zuckerberg et al. discloses that the process sterilizes fluid which is a contaminated air stream (see col. 1, lines 5-12). It is well known that air contains mainly nitrogen (approximately 78%) and oxygen (approximately 21%) as well as lesser amounts of argon, carbon dioxide, hydrogen, neon, helium, and other gases. These gases are entrained in the air stream and are reagents.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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3. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zuckerberg et al. as applied to claim 1 above, and further in view of Ungar (U.S. Patent No. 2,691,482).

Zuckerberg et al. fails to specifically teach a compressor that is a Roots-type positive displacement pump.

Ungar discloses a process for compressing a gas. The gas is passed through a Roots-type positive displacement pump in order to achieve a high compression ratio such as 5 to 1 (see col. 1, lines 1-55). This reference has been relied upon to teach a functionally equivalent pump (roots-type positive displacement pump) for compressing a gas.

Therefore, it would have obvious to replace compressor (24) with an equivalent viable alternative such as a Roots-type positive displacement pump as taught by Ungar. Furthermore, it would have been obvious to select the known Roots-type positive displacement pump in place of the compressor (24) based on its suitability and desired characteristics.

4. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zuckerberg et al. as applied to claim 1 above.

Zuckerberg et al. fails to teach the steps of providing a second pump and causing the contaminated fluid to pass sequentially through the pumps. However, in view of the legal precedent established by the prior case law St. Regis Paper Co. v. Bemis Co., Inc. 193 USPQ 8, 11 (7<sup>th</sup> Cir. 1977) which states that duplication of parts for a multiplied

effect has no patentable significance, it would have been well within the purview and obvious to one of ordinary skill in the art at the time the invention was made to provide a second pump (secondary compressor) for enhancing the overall sterilization and removal of contaminants from the contaminated air stream by further heating the air.

5. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zuckerberg et al. as applied to claim 1 above, and further in view of Homeyer et al. (U.S. Patent No. 6,280,691 B1).

Zuckerberg et al. discloses a heat exchanger (52) to preheat the air stream entering the compressor (24) (see col. 3, line 67 to col. 4, line 15). However, Zuckerberg et al. fails to specifically teach the step of preheating the fluid enter the compressor (24) with heat provided from the temperature of the fluid exiting the compressor (24).

Homeyer et al. discloses a process for purifying a contaminated indoor air stream (16) by first filtering the air using a filter (18), heating the air flow with a heat exchanger (20), passing the airflow through an oxidation catalyst (22) , passing the air flow through an ozone decomposition catalyst, and then passing the air flow through an outlet heat exchanger (30). The outlet heat exchanger (30) cools the treated air and sends the removed heat back to the inlet heat exchanger (20) to conserve heat energy and heat the inlet air stream (see figure 1; col. 2, lines 35-67). This reference has been relied upon to teach that it is well known to use recycled heat from the heated and treated



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outlet air to preheat the contaminated air entering into the sterilization zone and also conserve heat energy.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Zuckerberg et al. and include the step of recycling heat from the treated outlet air and send the removed heat to the preheating heat exchanger as taught by Homeyer et al. in order to conserve heat energy and thus achieve a more efficient process.

6. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zuckerberg et al. as applied to claim 1 above, and further in view of Lustig (U.S. Patent No. 3,555,787).

Zuckerberg et al. fails to teach a fuel entrained in the fluid supplied to the compressor.

Lustig discloses an air purifying and humidity control system. The process includes the steps of injecting fuel into a contaminated air stream and combusting the air and fuel mixture in a chamber to effectively sterilize the air stream and remove all contaminants (see col. 5, lines 20-51).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Zuckerberg et al. and include the step of adding fuel to the contaminated air stream, as taught by Lustig, prior to entering the compressor so that when the air stream is heated combustion will occur, thus sterilizing the air stream and ensuring that all contaminants are removed.

7. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zuckerberg et al. as applied to claim 1 above, and further in view of Houde et al. (U.S. Patent Application Publication 2004/0002126 A1).

Zuckerberg et al. discloses that after heating the air stream using a compressor the air is substantially completely sterilized, thus implying that the air must have been sampled after heating by the compressor to make such a determination. However, Zuckerberg et al. does not teach specifically the step of sampling the air stream to determine the extent to which contaminants are removed.

Houde et al. discloses a method for monitoring and detecting the presence of microorganisms in an air sample taken from a gaseous environment such as ventilation ducts of healthcare settings to ensure that the air is safe for people (see paragraphs [0001], [0003], [0006]). The air sampling can further be used for detecting microorganisms in the air of an air purifier (see paragraph [0111]). The air sampling is undertaken to control microorganism air contamination (see paragraph [0003]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Zuckerberg et al. and include the steps of sampling the air stream after heating to determine the extent to which contaminants have been removed and adjusting the treatment process in response to the sampling using a sampling process taught by Houde et al. in order to determine if the process is completely altering the fluid borne contaminants in the air stream.

***Claim Rejections - 35 USC § 102/103***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 21 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Zuckerberg et al.

Regarding claim 21, Zuckerberg et al. discloses a method of altering a fluid-borne contaminant, comprising the steps of: providing a pump (compressor (24)) having an inlet and an outlet; connecting the pump (compressor (24)) inlet to a source of contaminated fluid (contaminated air supplied to input baffle and filter arrangement (22) of a flow loop path – see col. 3, lines 23-45); operating the pump (compressor (24)) so as to elevate the temperature of the fluid and contaminants passing through the pump (compressor (24)) to about 360°F (360°F = 182°C about at least 200°C); and controlling the time during which the temperature of said fluid (air) and contaminants are elevated; to thereby alter substantially all of said contaminants passing through said pump (compressor (24)) (see col. 4, lines 15-30). It appears that 360°F (182°C) is about at

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least 200°C. In the event that Zuckerberg et al. does not teach sufficient specificity, it would have been obvious to one of ordinary skill in the art to vary the amount of the temperature slightly in order to optimize the sterilization process.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sean E. Conley whose telephone number is 571-272-8414. The examiner can normally be reached on M-F 8:30-5:00.

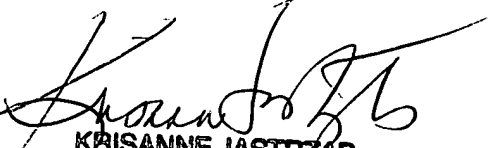
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gladys Corcoran can be reached on 571-272-1214. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

March 20, 2006

SEC

*S. E. C.*

  
KRISANNE JASTRAB  
PRIMARY EXAMINER